

VERSATILE CUSHION DEVICE

[01] This application is a continuation-in-part of US patent application No. 10/313,269, filed December 09, 2002, the specification of which is incorporated by reference herewith in its entirety.

FIELD OF INVENTION

[02] This invention relates to cushion or pillow devices for the comfort of persons while bathing in bath tubs or hot baths, sitting on chairs or sofas, or lying in beds or on floors; for example for persons bathing in various bathtubs, hot tubs or the like, especially to support bathers' lumbar regions instead of necks or shoulders only, or for soothing persons' bodies with therapeutic heating or cooling, or for supporting persons' back and spine on chairs, seats, sofas, or for stimulating or exercising person's back and spine, especially the hard to reach deep and small muscles in a person's back and spine on chairs, seats, sofas, beds or floors, or for maintaining person's posture in chairs, seats or sofas, or for maintaining a healthy alignment, especially sideways alignment, between the head and spine of a person in bed while sleeping, or the like. Since the primary purpose of the invention is supporting, exercising or soothing the upper and lower back and other body parts, the device will hereinafter be referred to as a "cushion" or "cushion device".

DISCUSSION OF PRIOR ART

[03] No matter how well designed, bathtub contours are usually too rigid to provide adequate support to bathers' lumbar regions and to allow comfortable sitting or lying in bathtubs. Also, most bathtubs provide a triangular hollow space between bathers' lumbar or lower back regions and the walls of the bathtubs, which causes significant discomfort especially to persons with lumbar or lower back pain or the like.

[04] Most related products are pillows designed to support bathers' shoulders and necks only. By doing so, they elevate bathers' bodies and enlarge the hollow space between their

backs and the walls of bathtubs, hence making the problem worse. Examples of such products are shown in the following U.S. patents:

5,014,373, issued May 14, 1991 to Dobine, and

5,140,713, issued Aug.25, 1992 to Pesterfield.

[05] Some products which do provide a certain degree of support for the back regions lack adequate mass to fill up the triangular hollow space to support persons' lower backs and are inherently buoyant, and therefore require firm fixing in the bath, for example by means of suction cups, and lack adequate maneuverability which is critical for a comfortable support. Such products are shown, for example, in the following U.S. patents:

2,483,077, issued Sept.27, 1949 to Walsh,

2,582,439, issued Jan.15,1952 to Kavanagh, and

3,078,474, issued Feb.26, 1963 to Chaitlen.

[06] Also known are water-filled pillows, or pillows which may be partly filled with water or other liquid, and which are designed for regular, i.e. non-bath, use, and which function somewhat similarly to water beds. These devices usually have only a single inlet/outlet port or opening and are not easy to fill, and are difficult to handle and to transport from a water source to a desired cushion location, especially when an adequate support is aimed and the required water mass is large and heavy. Such pillows are shown in the following U.S. patents:

3,900,910, issued Aug. 26, 1975 to Nakata;

4,724,560, issued Feb.16, 1988 to Christie;

4,896,388, issued Jan.13, 1990 to Bard; and

5,642,544, issued July 1, 1997 to Munoz.

[07] The present invention is designed to provide sufficient and ergonomic lumbar support to persons while sitting or lying in bathtubs, hence to improve their bathing comfort and relaxation, while maintaining an adequate level of maneuverability, handleability and transportability of the supporting device. The invention is also aimed at certain therapeutic treatments.

OBJECTS OF THE INVENTION

[08] Accordingly, it is an object of the invention to provide sufficient and easily maneuverable support to bathers' lumbar or lower back regions underwater to allow them to maximize health and therapeutic benefits of bathing.

[09] It is another object of the invention to provide a cushion device allowing automatic filling and draining which avoids otherwise required complicated or awkward filling and transporting operations.

[010] It is yet another object of the invention to allow simultaneous use of several of said cushion devices, due to the fact that said cushion device does not require firm fixing such as by means of suction cups, to obtain utmost lumbar support and comfort.

[011] It is yet another object of the invention to provide a convenient device for low risk fomentation (therapeutic heating) with no need for a strong or steady hand and little risk of scalding fingers (substantially hand-free) when filling said device with hot water. This is of importance to persons with weak or shaky hands.

[012] It is yet another object of the invention to provide a convenient device for cryotherapy (therapeutic cooling) with no need for a strong or steady hand (substantially hand-free) when filling the device with cold water. This is of importance to persons with weak or shaky hands.

[013] It is yet another object of the invention to provide a convenient device for mobile, adjustable and potentially thermal proprioception device (the term "proprioception used herein to define exercises of spine and associated muscles, especially those hard to reach deep and small muscles) to replace cumbersome plastic balance balls, so people can conduct exercise and protect their health and productivity virtually through the day and everywhere they go – at home, or at work, or even at theaters.

[014] It is yet another object of the invention to provide an adjustable sleeping support for maintaining a healthy alignment, especially sideways alignment, between the head and spine of a person in bed while sleeping,

[015] Further objects and advantages of the invention will become apparent from a consideration of the ensuing description and drawings.

SUMMARY OF THE INVENTION

[016] In accordance with one aspect of the invention, there is provided a cushion device which comprises:

[017] a flexible, hollow, enclosed shell, and being capable of containing gas or liquid without substantial leakage, and

[018] at least one port for allowing gas or liquid to enter into or to escape from said shell, said port or ports being provided with closure means for substantially preventing said entry and escape of gas or liquid from the shell, wherein said shell is capable of maintaining a minimum predetermined volume, a predetermined expanded shape or a substantial uprightness when the shell is open to ambient water or air pressure via said port or ports. The volume, shape or uprightness may be maintained, for example, by virtue of a sufficient stiffness, rigidity or firmness, which can result from material compounding, structural design selected from the group consisting of 'sea shell with ribs' structure or foraminous structure, or the like, of the cushion device, by spacing means or by other means for maintaining an expanded form and/or volume of the shell.

[019] In an embodiment of the invention, the cushion device has an upper end and a lower end (except when the device is disposed horizontally) defined by an edge or a corner of the device, wherein, preferably, one port is disposed near the upper end and the other port is

disposed near the lower end of the device to facilitate filling of the device with a liquid as will be explained hereinbelow.

[020] The cushion device may further comprise weight means so that, in a bathtub or similar use, at the beginning of the automatic filling process, the weight means tends to hold the lower end of said device at the bottom of said bathtub or the like to facilitate said filling process, and so that when the device is in water the weight means tends to hold the lower end of said device in a position below its upper end.

[021] The shell may include spacing means for maintaining a substantial volume of the shell when said port or ports are open to ambient (atmospheric) water or air pressure. The spacing means may comprise one or a plurality of substantially hollow or foraminous structures such as cylinders, cages, tubes, foam shapes, voluminous fiber masses made of substantially flexible material(s) such as polymer material(s) which allow(s) sufficiently free flow of gas and liquid between the outside and the inside of said hollow structures. The spacing means may be partially or entirely detached from the shell to enable an expansion of the shell over its standard shape (as opposed to conventional air mattresses where the level of over-inflation is limited by the seams between the segments). Alternatively, the spacing means can be integrated into the shell e.g. in the form of ribs or the like, and become an inseparable and integral part of the shell.

[022] The definition "hollow" denotes a shell that is suitable for a relatively easy ingress and egress of liquid, e.g. water, to and from the shell, notwithstanding any spacing means occupying a minor portion of the space inside the shell. The spacing means are thus such as not to substantially obstruct the ingress and egress of the liquid.

[023] The ports of the shell may include upper and lower ports arranged so that, when water is filling the shell through a lower port or a plurality of lower ports, air is being vented from an upper port or a plurality of upper ports. Preferably, the ports are mounted on said shell near its upper and lower ends respectively to avoid fluid-trapping dead spots inside said cushion.

[024] The shell is preferably a flexible container made of polymer material by means of a technology selected from the group consisting of heat sealing, welding, adhesive bounding, blow molding, rotational molding, vacuum forming or injection molding.

[025] According to another aspect of the invention, a method for providing cushioning support under liquid in a confined basin such as a bath, comprises the steps of:

[026] providing a cushion device in the form of a flexible hollow shell which is such as to maintain a substantially expanded condition when its interior is open to ambient gas or liquid pressure, said shell having a plurality of ports, each provided with a closure means;

[027] placing said device at the bottom of said basin when said basin is empty, with at least one of said plurality of ports near an upper end of said shell and at least one of said plurality of ports near a lower end of said shell, and with at least one upper and at least one lower of said ports being kept open,

[028] filling said basin with liquid while said liquid enters said device automatically through at least one port near the lower end of said device while gas is pushed out of said device through at least one said port near the upper end of said device, and

[029] closing all said ports once said basin is filled up to a desired level,

[030] whereby said device is filled automatically as the basin is being filled, and becomes ready for use.

[031] After use, at least one upper port and at least one lower port are opened to allow said device to be drained while or after said basin is being drained after use or if desired, whereby said device is ready for another cycle of use.

[032] According to another aspect of the invention, a method for providing cushioning support under liquid in a confined basin such as a bath, comprises the steps of:

[033] providing a cushion device in the form of a flexible hollow shell which is such as to maintain a substantially expanded condition when its interior is open to ambient gas or liquid pressure, said shell having a plurality of ports, each provided with a closure means;

[034] filling said basin with liquid to a desired level

[035] placing said device into said basin sufficiently vertically, with at least one of said plurality of ports substantially near an upper end of said shell and at least one of said plurality of ports substantially near a lower end of said shell, and with at least one upper and at least one lower of said ports being kept open. As said device lowers into the liquid in said basin, the liquid enters said device automatically through at least one port substantially near the lower end of said device while gas is pushed out of said device through at least one said port substantially near the upper end of said device, and

[036] closing all said ports once said device is submerged in the liquid,

[037] whereby said device is filled automatically, and becomes ready for use.

[038] After use, at least one upper port and at least one lower port are opened to allow said device to be drained while or after said basin is being drained after use or if desired, whereby said device is ready for another cycle of use.

[039] In accordance with another aspect of the invention, there is provided a method for providing fomentation or cryotherapy treatment, comprising the steps of:

a. providing a cushion device comprising a substantially flexible hollow shell that has a predetermined volume or shape and that is capable of maintaining an expanded condition when the interior of the shell is open to ambient pressure, said shell having one or a plurality of gas and liquid control ports each provided with a closure means;

- b. placing said device flat on an approximately horizontal surface, with at least one of said gas and liquid control ports open and facing upwards,
- c. filling said device with warm or cold liquid through said at least one port,
- d. closing said port or ports on said device once said device is filled to a desired level, and
- e. applying said cushion device to a body part in need of fomentation or cryotherapy treatment.

[040] In yet another aspect of the invention, there is provided a method for adjusting a cushion device, comprising the steps of:

- a. providing a cushion device comprising a flexible hollow shell having a predetermined volume or shape and spacing means for maintaining said shell in an expanded condition when the interior of the shell is open to ambient pressure, said shell having one or a plurality of gas and fluid control ports each provided with a closure means;
- b. opening at least one of said gas and fluid control ports and allowing said device to be filled with gas or liquid;
- c. introducing additional gas or liquid to further inflate said device, or emptying some gas or liquid out of said device; and
- d. closing said port or ports on said device once a desired level of inflation is achieved, while the device maintains another predetermined volume and shape.

Brief Description of the Drawing Figures

[041] Preferred embodiments of the invention will now be described with reference to the accompanying drawings, in which:

[042] Fig. 1 is a perspective view of the cushion device, without any pillowcase-type cover;

[043] Fig. 2 shows a cross-section of the cushion device on lines II-II of Fig. 1;

[044] Fig. 2a shows a similar section through a variation of the cushion device;

[045] Fig. 3 shows a longitudinal section of the cushion device on lines III-III of Fig. 1;

[046] Fig. 3a shows a similar view of the variation shown in Fig. 2a;

[047] Fig. 4 shows a front view of a slight variation of the cushion device shown in Fig. 1;

- [048] Fig. 5 shows a cross section of the same form of the device on lines V-V of Fig.4;
- [049] Fig. 6 shows a back view of a pillowcase-type cover with the cushion device inside it;
- [050] Fig. 7 shows similar back view of another variation of the cover with the cushion device inside it;
- [051] Fig. 8 is a perspective view of a bathtub with the cushion devices inside;
- [052] Figs. 9, 10 and 11 are perspective schematic views of a device in accordance with the invention in three successive positions,
- [053] Fig. 12 illustrates the use of the cushion device for lumbar muscular and spinal exercising (proprioception),
- [054] Fig. 13 illustrates the use of the cushion device for therapeutic heating or cooling (fomentation or cryotherapy), and
- [055] Fig. 14 illustrates the use of the cushion device for lumbar support in a dry environment such as on a sofa.

DETAILED DESCRIPTION

[056] Fig 1 is an illustration of a first embodiment of the cushion device without a cover of the pillowcase type; this will be referred to as the "core" of the device. The core consists of a flexible hollow shell 1, spacing means 2 within the shell, and one or a plurality of gas and liquid control ports 3. In the embodiment illustrated in Fig. 1, the shell defines two opposite large surfaces with a surrounding gusset. The ports include an inlet/outlet fitting 3a substantially near one edge of the shell, and an inlet/outlet fitting 3b substantially near the opposite edge of the shell, each fitting having a closure means 3c. Said port or ports may be located on any one or any plurality of sides of said cushion device. Also, as seen in Fig. 3, the core incorporates weight means 4 in its base.

[057] In alternative embodiments which do not require separate illustration, only one port 3 may be provided. It may be preferable to provide such a single port on one of the opposite large surfaces of the cushion device, corresponding to the main surfaces of a conventional pillow. Consequently, such a cushion device may be placed flat (horizontally) under a water tap with one of its large surfaces on a substantially horizontal substrate, the single

port facing upwards towards the water tap. The cushion device may now be filled with hot or cold water with no need for strong and/or steady hand to hold and fill the cushion and, hence, with little risk of scalding fingers (in case of filling with hot water).

[058] The flexible hollow shell 1 is made of a substantially flexible material and is mounted with the port fitting or fittings 3a and 3b, and is substantially air- and watertight when the port or ports are sufficiently closed by the closure means 3c. The port or ports allow water to enter the core and, once closed in, to provide desired body supporting function, and the contained water keeps the cushion at the bottom of a bathtub and at positions desired by users, instead of floating on the water surface or escaping from the desired position when the user moves and releases pressure on top of the cushion. The port or ports also allow air to enter the core and, once closed in, to provide desired body supporting function in chairs, sofas, car seats, beds or on floors.

[059] The spacing means 2 is made of a substantially flexible, elastic and durable polymer material for example in the form of a net or mesh. In the embodiment shown the material is shaped into one or a plurality of cylinders. The spacing means 2 keeps the cushion in an aesthetically pleasant and substantially expanded form when said port or ports 1s open to ambient pressure, which is critical for the sufficiently hand-free filling for fomentation or cryotherapy purpose, and the automatic filling and draining for underwater lumbar support feature of said cushion. It will be easily appreciated that the provision of the spacing means helps the cushion device to maintain a predetermined shape (e.g. a cuboidal shape), a minimum predetermined volume, or a substantial uprightness. This is of importance when using the cushion on a chair, sofa or in a car seat to support one's lower back for example – it is preferable that the cushion does not sag when placed “upright” against the backseat of the chair etc.

[060] In alternative embodiments which do not require separate illustration, said spacing means 2 may merge with said shell as an integral part of said shell. Thus said shell is adapted to maintain the predetermined volume, the predetermined expanded shape or the substantial uprightness due to its inherent property or properties selected from the group

consisting of firmness, rigidity or stiffness which can result from material compounding, structural design selected from the group consisting of 'sea shell with ribs' structure or foraminous structure, or the like.

[061] As an alternative to the above-described spacing means, the shell may be designed from a material having inherent rigidity, stiffness or thickness, e.g. a suitable polymer, in such a manner as to maintain a predetermined minimum volume and basic shape (i.e. the shape of the shell with no outside pressure thereon) when its ports are open to ambient pressure. This embodiment corresponds to Figs. 1-3 and 5 absent spacing means.

[062] The gas and liquid control port or ports 3 include one or a plurality of water- and airtight fittings 3a and 3b with sufficient openings for easy filling with air or water, and closure means 3c linked to the port fitting(s) for easy handling. Said port or ports are designed to fill the cushion with air or/and water to:

- provide cushioning support to persons' lower back, upper back, neck or other body regions;
- keep the cushion substantially at the bottom of a bathtub and at a position desired by users;
- provide adjustable softness or firmness and ergonomic shape of the cushion to allow optimal comfort,
- allow automatic filling and draining of the cushion,
- allow substantially hand-free filling for therapeutic heating and cooling, and
- allow exercise of spine and associated muscles substantially anywhere and anytime as desired by the user.

[063] The port fitting 3a, illustrated as disposed substantially near the upper edge of the shell 1 may alternatively be placed at the top (gusset) of the cushion, instead of at its side (large surface), to allow for better filling and draining of water and air. For the same purpose, the port fitting 3b may be placed at the bottom (gusset) of the cushion, instead of at the side.

[064] The weight means 4 assure that the cushion stays at the bottom of the bathtub during the initial filling process in case where said cushion is placed in the bathtub before the tub is being filled. Alternatively, the weight means may be eliminated.

[065] Fig. 2 shows a cross section of the cushion core, and shows the placement of the spacing means 2. The four cylinders that comprise the spacing means are positioned in close side-by-side parallel relationship.

[066] Fig. 2a shows a cross section of a variation of the cushion core, and shows the placement of the spacing means 2'. The spacing means comprise a plurality of flattened cylinders which are positioned one-in-the-other in parallel relationship.

[067] Fig. 3 shows a vertical section of the cushion core, showing the placement of spacing means 2 and the fittings 3a and 3b as well as closure means 3c. It also shows the weight means 4 in the form of a bar extending underneath the spacing means and tied down to the bottom of the shell.

[068] Fig. 3a shows a vertical section of a variation of the cushion core, showing the placement of spacing means 2' and the port fittings 3a and 3b as well as closure means 3c. It also shows the weight means 4 in the form of a bar extending underneath the spacing means and tied down to the bottom of the shell.

[069] Fig. 4 shows a slight variation of the cushion core, in which the two major face sheets 11 of the flexible enclosed shell have extensions 11a to make the cushion look like a conventional bed or couch cushion. This is mainly for aesthetic purposes.

[070] Fig. 5 shows a cross section of the same variation, and shows the placement of the spacing means 2 and weight means 4.

[071] The cushion so far described can be used on its own, or can be fitted into a pillowcase type cover 5 which can be safely used in a dry, ambient air environment or submerged in water.

[072] Fig. 6 shows the cover 5 with the cushion core inside it, this being a view from the back of the cover 5. The cover 5 is designed to provide a skin-friendly and comfortable 'touch and feel' and to provide decorative pleasure. It also has special side openings 6 for easy insertion and removal of the core and allows easy access and operation of the port fittings 3a and 3b as well as closure means 3c. The openings 6 are tight and closed by strings 7, if desired. These openings lie behind the side extension 5a of the front of the cover 5.

[073] Fig. 7 shows a variation of cover 5 with the cushion core inside it, this being a view from the back of the cover. It has two openings 8 specially suited to the gas and liquid control port fittings 3a and 3b for easy access and operation of the closure means 3c.

Operation

[074] The operation of the cushion device is similar to the way people use their cushions or pillows on their sofas or beds. For decorative purposes, one can simply place the cushion devices in a dry bathtub, as shown in Fig. 8, on a chair, sofa or car seat.

[075] Figs. 9, 10 and 11 illustrate respectively the filling process, the utility stage, and the draining process during the operation of the bath cushion device 1, as follows:

Fig.9: simply place the cushion device in a dry bathtub with the heavier side to the bottom while keeping at least one of the gas and liquid control ports 3 substantially near upper end of said cushion and at least one of the ports 3 substantially near the lower end of said cushion, and pull put the closure means 3c to open the at least two ports 3. Then start to let water in to fill the bathtub, but avoid direct water jet impact on the cushion device. This will cause water automatically to enter the cushion device through the lower port fitting 3b, while

existing air in the cushion device will be automatically pushed out through the upper port fitting 3a. As a result the cushion device is filled up automatically and simultaneously with the bathtub's filling process.

Fig.10: when the tub is filled to a desired level, close both port fittings 3a and 3b with the closure means 3c. The cushion device is then ready to be used to support back, shoulders, arms, legs, feet, and any other part of one's body in the bathtub. One can open one of said ports 3 to control the amount of water in the cushion device, hence to control the level of support or the ergonomic shape of the device.

Fig.11: after bathing, simply pull out the closure means 3c to open the two port fittings 3a, 3b near the upper and the lower ends of said cushion device, and start draining the bathtub. The water inside the device will automatically drain from the lower port fitting 3b while air enters the cushion device through the upper port fitting 3a; this assumes that an empty condition of the cushion device is desired. The device can also be kept in a filled condition for the next use especially in hot tubs. It is recommended to drain and replace the water in the device at least once a week.

[076] Alternative filling process, utility stage and draining process, which do not require separate illustrations, are as follows:

- 1: place the cushion device into a filled bathtub and maneuver the closure means 3c to open the ports 3, of which at least one should preferably be disposed near the upper end of the cushion and at least one port should be disposed near the lower end of the cushion. This will cause water automatically to enter the cushion device through the lower port fitting 3b, while existing air in the cushion device will be automatically pushed out through the upper port fitting 3a. As a result the cushion device is filled up automatically and simultaneously as it is lowered into the filled bathtub;
- 2: when the cushion is fully immersed in the filled bathtub, close said port fittings 3a and 3b with the closure means 3c. The cushion device is then ready to be used to support back, shoulders, arms, legs, feet, and any other part of one's

body in the bathtub. One can open one of the ports 3 to control the amount of water in the cushion device, hence to control the level of support or the ergonomic shape of the device;

3: after bathing, maneuver closure means 3c to open the two port fittings 3a, 3b near the upper and the lower ends of said cushion device, and start draining the bathtub. The water inside the device will automatically drain from the lower port fitting 3b while air enters the cushion device through the upper port fitting 3a; this assumes that an empty condition of the cushion device is desired. The device can also be kept in a filled condition for the next use, especially in hot tubs. It is recommended to drain and replace the water in the device at least once a week.

[077] When the bathtub is emptied, the cushion device can be rinsed and cleaned. If the device includes a cover, and the user desires, the cover can be taken off for washing or drying, and, if desired, the core can be dried with a dry towel or paper towel. When a fresh cover is back on the cushion device it is now ready to be placed in bathtub again for decorative and utility purposes.

[078] Accordingly, it will be seen that the bath cushion device of this invention can be used to support a bathers' lumbar region sufficiently to improve the bathers' comfort. It can be filled and drained automatically without special effort. It is a low cost solution to improve health and therapeutic benefits of bath taking. While costing only a fraction of a spa treatment, it turns every bath taking into a rejuvenating spa experience.

[079] As stated hereinabove, the cushion device of the invention may also be used for therapeutic heating, therapeutic cooling and for lumbar muscular and spinal exercising, typically defined by the medical profession as proprioception.

[080] For the therapeutic heating or cooling use as illustrated in Fig. 12 where the cushion is designated as 14, the device, in the single-port or multi-port version, is filled with adequately hot or cold liquid, e.g. water, and then, with the port or ports closed, it is placed in a bed, on a sofa, chair etc. to warm or cool a user's body, e.g. legs, neck, lumbar region

etc. in need of such treatment. Since the cushion device of the invention is designed to maintain a predetermined volume even when open to ambient pressure (with open port or ports), it is relatively easy to fill it with hot or cold water by placing the device with one of its large surfaces flat on an approximately horizontal surface under a water tap etc. The filling can now proceed without holding the device thus avoiding scalding (in the case of hot water). This is critical for persons with weak or unsteady hand(s), such as handicapped persons, arthritis patients and seniors.

[081] Alternatively, the cushion device may be filled with gas or liquid to a desired degree and placed, with its port or ports closed, on a chair in a "horizontal" position, i.e. with one of its large surfaces facing up. The user may now sit on the cushion and balance his/her hips and lumbar region similarly as on a large medical balancing ball, thus exercising the lumbar spine and the associated muscles, especially the hard to reach deep and small muscles in their back and spine, as illustrated in Fig. 13 where the cushion is designated as 14. This beneficial exercise can thus be combined with work and home life.

[082] As stated hereinabove, the cushion device of the invention may also be used for supporting backs and other body parts in dry environment such as chairs, sofas, car seats, beds etc. To this end the cushion may be filled with gas or liquid to a desired level and be placed, with port or ports closed, in a chair in a sufficiently "vertical" position. The user may now sit on or lean against said cushion to obtain desired support as illustrated in Fig. 14 where the cushion is designated as 14.

[083] As stated hereinabove, the cushion device of the invention may also be used as sleeping support to help maintain healthy alignment between head and spine of a person during sleep. To this end the cushion may be filled with gas or liquid to a desired level and be placed, with port or ports closed, flat in bed. The user may now rest their head on said cushion to obtain desired support as illustrated in Fig. 15 where the cushion is designated as 14.

[084] Owing to the air and water-tight design, the device may also be used as “overfilled”, i.e. filled with gas or liquid to expand its volume above the predetermined level (“over-inflated”), or partially filled with gas or liquid, or “under-inflated”. In the latter case, one port of the device is opened and the device is squeezed to push some gas (or liquid, if any) out of the shell. At a desired degree of filling, the port or ports are closed and the device may be used as desired, e.g. to provide cushioning, fomentation, cryotherapy, proprioception or sleeping aid etc. For over-inflation, the spacing means should be partially or entirely detached from the shell.

Advantages

[085] From the description above, a number of advantages of the invention become evident:

- The device is likely to significantly improve people’s bathing experience, potentially improve people’s health, recreation, productivity, and quality of life;
- Unlike other products, this invention provides strong support to the lower back (i.e. it has sufficient mass to fill the usual triangular hollow space in bathtubs) and hence greatly reduces the tensions not only in the lower back but also in the shoulder, neck areas and the entire body;
- The device being suction-cup free and freely maneuverable underwater without tendency to float, allows usage of plural cushions in a bathtub to maximize support to a bather in a bathtub and further improve the health and therapeutic benefits of bath taking;
- Being designed to remain in bathtubs when not in use, the device allows people to effectively bring color and design into bathtubs, which will translate traditionally clean but clinical bathtubs into a cozy oasis in people’s homes;
- The design of the cushion of the invention avoids the regularly required blowing up of air-inflatable pillows or cushions via the human mouth which is both cumbersome and unhygienic;

[086] The design of the cushion of the invention avoids the required carrying of a filled cushion from a water source when used as a underwater lumbar support;

[087] It maintains the temperature of the water inside the cushion longer than the bath water which usually cools down relatively promptly after said tub is filled. This improves bathing experience;

[088] It allows the cushion to easily be filled with water at the same temperature as the bath, which could not easily be achieved with the prior art water-filled pillows.

[089] When bathtubs are not in use, the cushion(s) of the invention can remain in pleasantly expanded predetermined shape and remain in bathtubs with their cases contributing beautiful color, pattern, shape and design. The skin-friendly covers are also key to further bath-takers' comfort.

[090] Further, the device can maintain a predetermined shape, dependent e.g. on the shape and type of the spacing means, for example when placed "upright" on a chair, car seat etc. to serve as a lumbar support; The cushion also provide an adjustable and universally ergonomic back and body support that automatically contour persons' backs and various body regions no matter their shapes or sizes..

[091] The cushion can also maintain an approximately predetermined volume when used as a proprioception device and provide a mobile, adjustable and thermal proprioception assistance to allow persons to exercise their spine and associated muscles, especially the hear to reach deep and small muscles, substantially anywhere and anytime they desire, at home or at work, e.g. in meetings or at theaters.

[092] The cushion also provides a low risk and substantially hand-free fomentation and cryotherapy device that needs no strong or steady hand to hold and fill, and that has little risk of scalding fingers in case of filling it with hot water.

[093] The cushion also provides an adjustable, soft yet non-compressive sleeping support that helps maintain a healthy alignment, especially sideways alignment, between the head and spine of a person during sleep.

[094] It is also easily conceivable to use known thermo-insulating materials in the design of the cushion device, whereby the temperature of the warm or cool liquid inside will not change as quickly as in open containers or in water bottles. This is of importance for a proper therapeutic heating or cooling.

[095] Although the description above contains many specifics, these should not be construed as limiting the scope of the invention but as merely providing illustrations of some of the presently preferred embodiments of this invention. For example, the cushion device can have other shapes, gas and fluid control port or ports can be mounted at various positions in various numbers, the spacing means can be formed integrally with the shell of the cushion, the gas and liquid control ports or port fittings can also be formed integrally with said shell. Also, a shell can be made in such a way, through blow molding, rotational molding, vacuum forming, injection molding, etc., that both said spacing means and said control ports can be formed integrally with the shell, and the shell will stay sufficiently expanded when one or more ports are open to ambient pressure and being sufficiently flexible to support persons' back and other body regions ergonomically when filled with water, or air, or mix of water and air. The control port or ports can be closed by closure means such as plug-in caps, screw-on caps, snap-on caps, flat sliding closures, rotational cylinder closures, etc. Furthermore said cushion device can be used to provide support to other parties or objects rather than human beings alone. The way of operation of said cushion may vary as well.

[096] Thus the scope of the invention should be determined by the appended claims and their legal equivalents, rather than by the examples given.